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Indian Standard

SPECIFICATION FOR DESICCATORS

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3 *November* 1971

Indian Standard

SPECIFICATION FOR DESICCATORS

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AMENDMENT NO. 1 JULY 2007
TO
IS 6128 : 1971 SPECIFICATION FOR DESICCATORS

(*Page* 4, *clause* **6.1.1**) — Substitute the following for the existing clause:

'**6.1.1** *Limit of Alkalinity* — When graded according to the method prescribed in IS 2303 (Part 1/Sec 1) : 1994†, desiccators shall conform to Class HGB 3 of glass.'

(*Page* 4, *footnote marked* †) — Substitute the following for the existing:

'†Grading glass for alkalinity : Part 1 Hydrolytic resistance, Section 1 Hydrolytic resistance of glass grains at 98°C – Method of test and classification (*first revision*).'

(*Page* 8, *clause* **7.1.1**) — Substitute the following for the existing clause:

'**7.1.1** *BIS Certification Mark*

Desiccators may also be marked with the Standard Mark.

7.1.1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.'

(CHD 10)

Reprography Unit, BIS, New Delhi, India

Indian Standard
SPECIFICATION FOR DESICCATORS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 18 April 1971, after the draft finalized by the Laboratory Glassware and Related Apparatus Sectional Committee had been approved by the Chemical Division Council.

0.2 Desiccators are tightly closing glass vessels constructed to withstand implosion and in which materials of all types may be dried (or cooled) without contact with outside air, with the help of a drying agent or under vacuum. Therefore, considering them as pressure vessels subjected to a pressure of one atmosphere a test has been prescribed to ensure safety in handling. With a view to preventing possibilities of implosion vacuum desiccators should as far as possible be spherical in shape which is the best suited to withstand external pressure.

0.3 In this standard a desiccator having a nominal size 150 mm and capable of conversion from non-vacuum (Type 2) to vaccum type (Type 1) has also been prescribed (*see* Patterns B and D). This conversion from non-vacuum to vacuum type is possible by drilling a hole in the knob and fitting a sleeve over it for vacuum connections, the knob and the sleeve being suitably ground to make a leak-proof fit.

0.4 In the preparation of this standard assistance has been derived from BS 3423 : 1962 ' Recommedations for the design of glass vaccum desiccators ' issued by British Standards Institution, and DIN 12490 ' Desiccators ' and DIN 12491 ' Vacuum desiccators ' issued by Deutscher Normenausschuss.

0.5 This standard has clause **7.2** which provides for agreement between the purchaser and the supplier.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes requirements and the methods of sampling and test for desiccators.

2. TERMINOLOGY

2.1 For the purpose of this standard, definitions given in IS : 1382-1961* shall apply.

3. TYPES AND PATTERNS

3.1 There shall be 2 types and 4 patterns of desiccators, namely:

Type 1 — Vacuum desiccators in Patterns A and B, and

Type 2 — Non-vacuum desiccators in Patterns C and D.

4. NOMINAL SIZES

4.1 Desiccators shall have the following nominal sizes except for Patterns B and D which shall be in nominal size 150 mm only:

Type 1 — 100, 150, 200, 250 and 300 mm, and

Type 2 — 100, 150, 200 and 250 mm.

5. DESIGNATION

5.1 Desiccators shall be designated by their nominal size followed by the pattern. For example, a vacuum desiccator of nominal size 100 mm and Pattern A shall be designated as '100 A'.

6. REQUIREMENTS

6.1 Material — Desiccators shall be made of transparent glass not having any pronounced tint and shall be as far as possible free from stones, bubbles, cords and other visible defects. They shall be reasonably free from strain.

6.1.1 *Limit of Alkalinity* — When graded according to the method prescribed in IS : 2303-1963† desiccators shall conform to Type 3 of glass.

6.2 Construction and Finish — Desiccators shall be regular in shape and smoothly finished. They shall be symmetrical about the axis which shall be perpendicular to the plane of the base.

*Glossary of terms relating to glass industry.

†Method of grading glass for alkalinity.

6.2.1 *Base* — The base shall enable the desiccator to stand vertically without rocking or spinning on a plane horizontal surface. For increasing the stability and as protection against cracking, extra glass may be provided externally to form a protective rim at the base.

6.2.2 *Side* — The side of the desiccators shall be stepped to accommodate perforated dessiccator plates without rocking, in a plane parallel to the base.

6.2.2.1 The lower part of the side, when making an acute angle with the base, shall be inclined at an angle not less than 75°.

6.2.2.2 The upper part of the side above the step shall rise in the form of a vertical cylinder and end in a flange.

6.2.3 *Lid* — The lid of desiccator shall be part-spherical in shape. Its rim shall form a flange the surface of contact of which shall match that of the flange of the body of the desiccator evenly.

6.2.3.1 The lid in the case of Type 1 desiccators shall be provided at the top, for vacuum connection with the following:

a) An opening in the form of a conical ground glass socket, or

b) An opening for rubber stopper, or

c) A suitable ground knob to take a ground glass sleeve.

NOTE — The vacuum adopter should be constricted below the stopcock so that sudden opening to a vacuum pump or the atmosphere may not cause too abrupt a change in pressure inside the desiccator.

6.2.3.2 The lid in the case of Type 2 desiccators shall be provided with a knob at the top for ease of handling.

6.2.4 *Grinding of Flanges* — The pressure-tight surfaces of the flanges of the body and the lid shall be separately ground plane so that they are interchangeable. They shall be ground fine so that the assembled desiccator, or its body or lid, when tested, separately according to the method prescribed in Appendix A shall pass the test.

6.3 Dimensions — The dimensions of Types 1 and 2 desiccators shall be as prescribed in Tables 1 and 2 respectively in accordance with figures given therein.

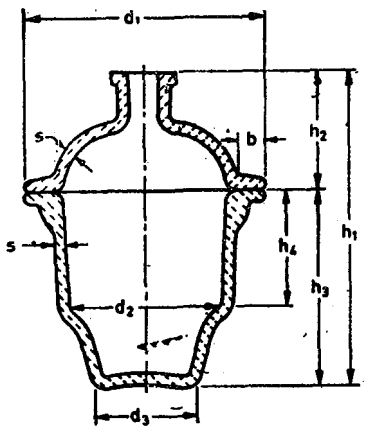
6.3.1 For Type 1 desiccators details of dimensions as are not specified may be so chosen that the desiccators, when tested in accordance with the method prescribed in Appendix B, shall pass the test.

NOTE — For this purpose it is recommended that the wall thickness at the bottom may be increased to an appropriate extent.

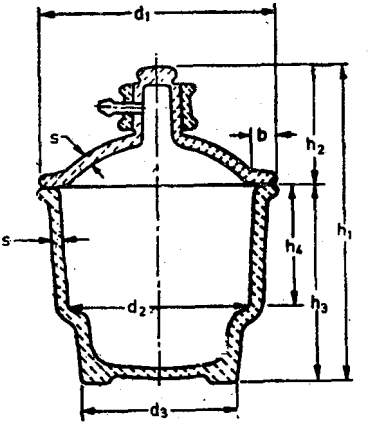
TABLE 1 DIMENSIONS OF TYPE 1 (VACUUM) DESICCATORS

(*Clause* 6.3)

(All dimensions in millimetres)



PATTERN A



PATTERN B

Sl No.	Nominal Size	b Min	d_1 −3	d_2 Min	d_3 Min	h_1 Max	h_2 Max	h_3 Max	h_4 Max	S Min	Corresponding Nominal Size of Desiccator Plate	
											Type 1*	Type 2*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	100	13	155	97	65	172	57	115	60	4	100	100
ii)	150†	16	198	146	120	255	95	160	85	5	150	150
iii)	150	16	215	146	90	233	78	155	85	5	150	150
iv)	200	16	270	195	125	298	93	205	120	6	200	200
v)	250	20	330	244	160	355	115	240	125	7	—	250
vi)	300	22	380	292	185	420	135	285	151	8	—	300

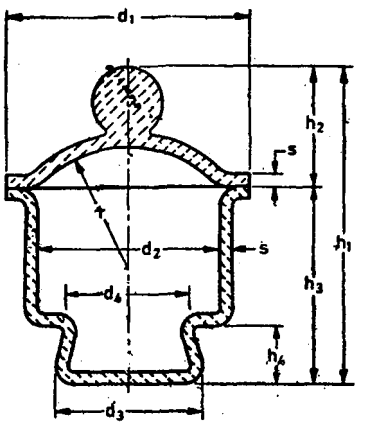
*See IS : 6154 - 1971 Specification for perforated plates for desiccators.

†Desiccator conforming to Pattern B shall be made to this size only.

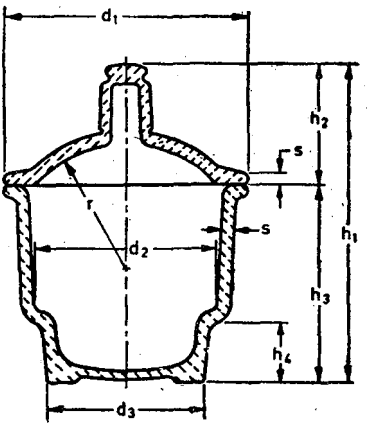
TABLE 2 DIMENSIONS OF TYPE 2 (NON-VACUUM) DESICCATORS

(*Clause* 6.3)

(All dimensions in millimetres)



PATTERN C



PATTERN D

Sl No.	Nominal Size	d_1 ±5	d_2 ±5	d_3 ±5	d_4	h_1 Max	h_2 Max	h_3	h_4	S ±1		Corresponding Nominal Size of Desiccator Plate Type 1*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	100	150	100	85	70±5	174	55	115±4	40±5	4	80±10	100
ii)	150†	198	146	120	—	255	95	155±5	65±5	8	120±15	150
iii)	150	210	150	135	105±5	231	65	160±6	60±5	4	120±15	150
iv)	200	270	200	180	135±10	318	80	230±8	90±5	5	160±20	200
v)	250	325	250	230	170±10	350	90	250±10	100±10	6	190±25	200

See IS : 6154 - 1971 Specification for perforated plates for desiccators.

†Desiccator conforming to Pattern D shall be made to this size only.

7. MARKING AND PACKING

7.1 Marking — Desiccators shall be permanently and legibly marked on the body and the lid with the following:

a) Designation;

b) Maker's name or registered trade-mark, if any;

c) Type; and

d) Size of cone or socket for the vacuum connection (for Type 1 only).

7.1.1 Desiccators may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7.2 Packing — Desiccators shall be packed individually as agreed to between the purchaser and the supplier to protect them from damage during transit and storage. The packages shall be marked with the pattern of desiccators.

8. SAMPLING

8.1 Representative samples of desiccators shall be drawn and adjudged as prescribed in IS : 4426-1967*.

APPENDIX A

(*Clause* 6.2.4)

TEST FOR PRESSURE-TIGHT SURFACES OF GROUND FLAT FLANGES

A-0. GENERAL

A-0.1 This test is applicable either to the assembled desiccator or to either part against a reference plate. This test assesses the rate of leakage of the clean dry flange under a small controlled reduced pressure.

*Method of sampling laboratory glassware and medical glass instruments.

The sensitivity of the test is independent of the volume of the desiccator and for practical purpose, independent of the dimensions of the flange.

A-1. APPARATUS

A-1.1 The recommended apparatus is illustrated in Fig. 1. A suction line is connected by a T-piece (*B*) to a reduced pressure regulator (*A*) a test-tube closed by a rubber bung and carrying the tube (*C*) open to atmosphere. The depth of immersion of this tube in water in (*A*) determines the controlled reduced pressure head *h*, 300 mm being the selected value. The T-piece (*B*) is further connected to a conventional form of flowmeter (*D*) having a manometer height greater than *h*, containing conveniently coloured water as the manometric liquid, and a control capillary (*E*). For this purpose, a 30-mm length of 0·5 mm precision bore tubing, clean cut at both ends, is considered suitable but for more critical use the bore may be decreased to 0·4 mm.

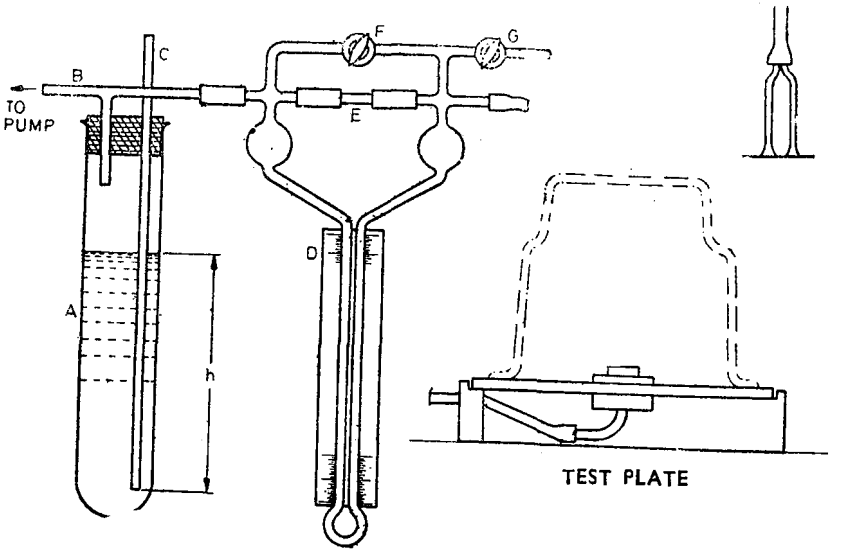


FIG. 1 APPARATUS FOR TESTING PRESSURE-TIGHT SURFACES OF THE GROUND FLAT FLANGES OF DESICCATORS

The flowmeter is also provided with a bypass cock (*F*) of not less than 5 mm bore, and a release cock (*G*). The article under test is connected by rubber tubing to (*J*). For the suction pump a water jet pump or a small vacuum pump is suitable.

A-2. PROCEDURE

A-2.1 For Testing a Complete Vacuum Desiccator — Connect the end (*J*) to the opening of the desiccator by a rubber bung or greased joint, the flanges being clean and dry. Start the suction pump, close tap (*G*) and open tap (*F*). With tube (*C*) bubbling freely, allow a few seconds to elapse so that the pressure stabilizes. Close tap (*F*) and take the manometer reading.

NOTE — At the conclusion of the test, open taps (*F*) and (*G*) in that order.

A-2.2 For Testing Lid and Body Separately — Connect the end (*J*) to the centre of a test-plate made of glass, not less than 12·7 mm in thickness and place either the lid or the body on it; the flange, clean and dry resting on the test-plate. Repeat the procedure as given in **A-2.1.**

A-2.3 The desiccator or the lid or the body, as the case may be, shall be treated as having satisfied the requirements of the test if the manometer reading is not less than 22 mm.

APPENDIX B

(*Clause* 6.3.1)

TEST FOR HYDRAULIC EXTERNAL PRESSURE

B-0. GENERAL

B-0.1 The desiccator is tested in a pressure vessel by subjecting it to a hydraulic external pressure of 4·2 kg/cm^2 for 1 minute.

B-1. APPARATUS

B-1.1 The recommended apparatus is illustrated in Fig. 2. The apparatus consists of a pressure vessel provided with a pressure gauge and connected to a water reservoir fitted with a ram pump and a release valve discharging back into the reservoir.

NOTE — The lid of the pressure vessel is fastened to the vessel by means of wing-nuts for ease of operation.

B-2. PROCEDURE

B-2.1 Assemble the desiccator after cleaning and greasing the flange faces (and the cone and socket in case of Type 1) and close the desiccator at atmospheric pressure. To ensure submersion, hold the desiccator in the

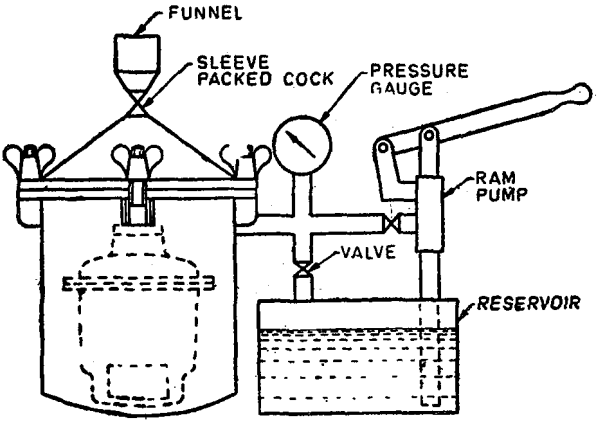


FIG. 2 APPARATUS FOR TEST FOR HYDRAULIC EXTERNAL PRESSURE

pressure vessel in some holding device or, alternatively, place weights wrapped in paper or cloth inside it. Having placed the desiccator in position and fastened the lid, fill the pressure vessel with water and bring up the pressure to 4·2 kg/cm^2 by working the ram pump and release it immediately after 1 minute.

B-2.1.1 The desiccator shall be taken to have satisfied the requirement of the test if it withstands the pressure for 1 minute.

NOTE — A test of this duration indicates that a desiccator passing it could be expected to withstand indefinitely a pressure differential (external) of 1 kg/cm^2 provided the glass is not abraded, bruised or otherwise damaged in subsequent service.

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